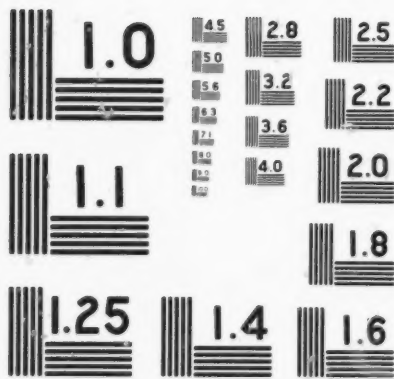


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COGNITIVE GAINS IN "DEPRIVED" CHILDREN THROUGH INDIVIDUAL
TEACHING OF LANGUAGE FOR ABSTRACT THINKING.

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DESCRIPTORS- *COGNITIVE DEVELOPMENT, *PRESCHOOL LEARNING,
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REASONING, LANGUAGE INSTRUCTION, *LANGUAGE DEVELOPMENT,
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THE MOST DISABLING HANDICAP OF YOUNG CHILDREN FROM
DEPRIVED SOCIOECONOMIC BACKGROUNDS IS THEIR DIFFICULTY IN
USING LANGUAGE ABSTRACTLY. IN THIS STUDY, THEREFORE, IT WAS
HYPOTHESIZED THAT IF AN EDUCATIONAL INTERVENTION PROGRAM WAS
LIMITED TO THE DEVELOPMENT OF ABSTRACT LANGUAGE, THEN NOT
ONLY LANGUAGE, BUT MANY OTHER ASPECTS OF THINKING WOULD BE
FACILITATED. THE DESIGN OF THIS PROGRAM WAS BASED ON SEVERAL
ASSUMPTIONS THAT REQUIRED (1) THAT THE INSTRUCTION BE BASED
ON INDIVIDUAL TUTORING, (2) THAT EACH CHILD BE SEEN FOR SHORT
DAILY SESSIONS, (3) THAT EVERY TASK SET FORTH BY A TEACHER BE
COMPLETED, EVEN IF IT HAD TO BE SIMPLIFIED, AND (4) THAT THE
PROGRAM BE MODIFIED TO FIT THE INDIVIDUAL NEEDS OF EACH
CHILD. SUBJECTS WERE 12 PRESCHOOL DISADVANTAGED CHILDREN
SELECTED FROM A NURSERY SCHOOL. THE CHILDREN WERE MATCHED FOR
STANFORD-BINET AND LEITER IQ SCORES, AGE, AND SEX. ONE
CONTROL GROUP OF SIX REMAINED IN THE TRADITIONAL NURSERY
SCHOOL PROGRAM. ANOTHER CONTROL GROUP OF TWO RECEIVED
INDIVIDUAL ATTENTION BUT NO TUTORING, WHILE AN EXPERIMENTAL
GROUP OF FOUR RECEIVED DAILY PROGRAM TUTORING. RESULTS SHOWED
A RAPID, MARKED GAIN IN IQ FOR THE EXPERIMENTAL GROUP. THIS
SHORT-RANGE, SMALL-SAMPLE STUDY IS ONLY SUGGESTIVE OF THE
POSSIBLE BENEFITS OF THIS APPROACH. (DK)

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Cognitive Gains in "Deprived" Children Through
Individual Teaching of Language for Abstract Thinking
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For the past several years, there has been a growing interest in the cognitive deficiencies of children from deprived socio-economic backgrounds. The majority of programs thus far developed in the area of cognitive enrichment have attempted to use multi-faceted intervention designed to overcome the numerous deficiencies that the deprived child may demonstrate (1,2). This approach has led to the concept of enriching the total environment (through better designed equipment, trips, language training, etc.) so as to give the children an opportunity to experience a wider and different range of stimuli from those normally available to him. In the present paper, I have outlined a program, different in both structure and techniques, from that based on the idea of total enrichment. The program focussed on helping the child to develop an abstract language system which he would readily turn to in all problem solving tasks. Although these children have been found to have numerous difficulties, the formulations of developmental theorists (3) would suggest that their most disabling handicap is their marked difficulty in using language abstractly. It was therefore hypothesized that if educational intervention was limited just to the development of abstract language, this system would play such a vital role in the child's cognitive development that it would facilitate not only language, but many other aspects of thinking. The results reported here support this hypothesis. Several basic assumptions underlay the design of the program. These were:

1. Young children who do not yet have a firm language base will use language to direct their thinking only if they are consistently guided to do so. This assumption required that the most effective teaching be based on individual tutoring.
2. Young children have short attention spans and therefore need relatively brief but frequent reinforcement of new skills. The program was designed so that the child was seen for short daily sessions (i.e., five days a week for 15-20 minutes each day) resulting in a total of about 1 1/2 hours of tutoring per week.
3. The young child will have difficulty in using what is initially a more complex mode of thinking and he will develop means of avoiding the tasks. To prevent the development of firm patterns of resistance, the child was never permitted to leave a task unfinished. If necessary the task was simplified, but the child still had to fulfill the demands set forth by the teacher.
4. Language acquisition, like any new skill, is characterized by marked individual differences; even consensual validation of common words does not yet exist in young children. Because of these differences, the teaching program was modified to fit the individual needs of each child.

Although a variety of teaching methods were employed, they shared certain specific features. First the child was always confronted with situations in which no gestures were used by the teacher and in which the language had to be understood for the task to be accomplished correctly. Second the child was required to produce independently a response relevant to a situation created by the teacher; at no time could he act passively or simply imitate the teacher's actions. Third, he was always required both to work within the confines outlined by the teacher and to extend independently the situation set forth by her. This extension focussed on having the child discuss situations which did not exist in front of him at the moment, but which were relevant to the present situations (e.g., past, future, alternative courses of action, predicting the outcome of an action, giving explanations of events, etc.). Fourth, the discussions were designed to encompass a sequence of interrelated events so that the child would both have to sustain his attention and be able to see a particular event as being part of a certain framework.

Labeling was not emphasized since labels simply accompany an observation and do not extend a child's awareness of an object or behavior, i.e., to call an object a "book" may facilitate communication, but it does not abstract anything more of the object than does a gesture towards the object. By contrast a word such as "top" reflects a much more abstract structuring of reality. The word "top" can refer to the "top" of one's head, the "top" of one's desk, the "top" of a building. All these instances, though grossly physically different, can be unified by the word "top". The word refers to a common although not immediately obvious characteristic which emerges because of the understanding that "top" refers to the "highest point" on anything regardless of how different the "anythings" look. Many concepts like this can be made available, at least in preliminary form, to young children. Therefore, the more abstract functions of language were emphasized by using concepts that required the child to a) abstract some essential but not immediately evident feature from an object (e.g., "Show me the side of the toy"), and b) recognize the relatedness among a series of events or impose some sort of organization onto a series of objects (e.g., ask the child "How could I make this pile of blocks as small as that pile?"). The following concepts illustrate the type of material emphasized in the study.

a) Number - mainly numbers 1-4, ranging from spatial presentation (e.g., 2 objects) to temporal-spatial (e.g., counting taps of a pencil) to temporal (e.g., counting taps without seeing any source).

b) Direction - up, down, underneath, on top of, over, under, behind, in front of, middle.

c) Speed - fast, slow, quick, not fast, not slow.

d) Size - big, little, bigger, smaller, tiny, small, large.

e) Temporal sequences (time) - before, later, during, now, while, wait, next.

f) Facial expressions and the emotions they convey - (e.g., frowning-worry, smiling-happiness, crying-sadness, etc.).

g) Parts of the body and their function - (e.g., with what part of your body do you hear things; with what part of your face do you eat, etc.).

In a situation designed so that the child learns by himself (e.g., programmed instruction), the content and structure of the materials is of utmost importance. In the present situation the stress was on developing abstract language through constant guidance and therefore almost any materials could be suitable. Accordingly, common inexpensive objects readily available in the child's environment were the only ones used (e.g., paper, pens, blocks, toy cars, simple books, etc.). The materials were used mainly as points of departure from which the child could discuss increasingly abstract situations, which did not exist at the moment in front of the child.

The subjects were selected from a nursery school in a socio-economically deprived area in New York City. The entire group of 12 children from the youngest class were tested on the Stanford Binet Intelligence Test (S-B) and the Leiter Scale. Based on the initial test results, the children were divided into two groups matched as evenly as possible for IQ, age, and sex. One group of 6, which served as the control group (C_1), remained in the traditional nursery school program with no additional attention given to them. The other group of 6 was divided into an experimental group of 4 children (E) and a second control group of 2 children (C_2). The E group received daily individual tutoring for 15-20 minutes per session along the lines outlined above; the C_2 group received daily individual sessions with the same teacher as for the E group, but no attempt was made to tutor them. The C_2 group was included to control for the possible role of individual attention on facilitating intellectual performance. The E and C_2 group had to be limited to a total of 6 since it was not possible within the confines of the regular school program to deal with more than 6 children a morning.

The tutoring was conducted for a period of three months after which the children were retested. Both the pre- and post-testing were conducted by two assistants who did not know to which of the groups the children had been assigned. In addition, they had no contact with the children other than at the time of testing.

The teaching was done by a trained nursery school teacher who had no knowledge of the tests given to the children nor of the types of items contained in these tests.

As shown in Table 1, the pre- to post-test results on the S-B show a clear marked

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Insert Table 1 about here
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gain for the E group and no such clear gain for either the C₁ or C₂ groups. It should also be noted that a sizeable increase occurred for all four children in the E group regardless of their initial IQ level. This result contrasts with the findings (2) that the IQ improvement is most marked for children with initially low scores. The lack of a clear gain on the S-B in the C₂ group suggests that the element of individual attention from an adult without specialized tutoring was not sufficient to achieve the rise in IQ scores.

The results on the Leiter scale, though somewhat less marked, are in accord with those of the S-B with the E group showing more marked gains than either the C₁ or C₂ groups. In addition, in contrast to the variable gains and losses in the C₁ group, all the children in the E group showed some gain on their retest score. The lower overall gains on the Leiter scale may be a reflection of the fact that this test does not require verbal abilities while the teaching techniques emphasized verbal development.

One child (E_a) is of particular interest since prior to the study she was so excessively withdrawn that she had not uttered a single coherent sentence in her first nine months at school. Her verbalizations has consisted almost solely of limited, garbled nonsense syllables. Within one month after the program was started, she was speaking clearly, coherently, and appropriately; her IQ change at the end of three months was a gain of 28 points on the S-B and of 19 points on the Leiter.

This study with such a small group is of course only suggestive of the possible benefits of this approach. In addition, it is believed that the program would have to be maintained for a considerable period of time (i.e., probably about 2-3 years) for the gain to be maintained thereafter independently by the child. Abstract language is still difficult for these children and they need continuing guidance for such language to become firmly established. However, considering the amount of time (approximately 60-90 minutes per week per child), the low cost of the materials, and the rapid gains in performance, it seems worthwhile to pursue this program as a technique for facilitating cognitive growth in young children from deprived backgrounds.

Summary

The paper reports the results of a pilot study designed to facilitate cognitive development in the young child through the use of short, daily individual tutoring sessions emphasizing the development of an abstract, language system. The role of individual attention was controlled through the use of a group who had daily individual sessions without the specialized tutoring. A second control group was included consisting of children who received their usual training in the regular nursery school program. The results show a marked gain in IQ for the group who received the specialized tutoring and much less significant gains for the other two control groups.

Table 1 Pre and post test results of all subjects

Subjects			Stanford-Binet IQ			Leiter Score					
Group	Age ¹	Sex	Pre-test	Post-test	Change		Pre-test	Post-test	Change		
E	a	3.8	F	70	98	+28		83	102	+19	
	b	3.11	F	100	109	+9	18.00	59*	72	+13	9.25
	c	3.3	M	111	127	+16		111	112	+1	
	d	3.11	M	90	109	+19		75*	79	+4	
C ₂	a	4.4	M	101	99	-2	1.00	94	98	+4	7.00
	b	4.2	M	84	88	+4		69*	79	+10	
C ₁	a	4.6	F	97	99	+2		96	83	-13	
	b	3.5	F	105	107	+2		93	111	+18	
	c	4.2	M	115	124	+9	2.00	98	100	+2	-.50
	d	4.2	M	88	88	0		84	78	-6	
	e	3.11	F	105	103	-2		89	100	+11	
	f	3.5	M	93	94	+1		95*	80*	-15	

* No basal achieved, 2 years assumed for calculations, i.e. 8 given basal of 2 plus additional credits for later tests passed.

¹ Age at beginning of study

References and Notes

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